

Grass plant

- Inflorescence
- Spikelets made of individual florets
- Flower is key characteristic to ID, so to ID a grass, usually need mature seed head



So it is easiest to Identify by

- Growth habit
 - Tillers (bunch grass)
 - Rhizome (spreading grass)
 - Stolon (running grass)
- Environmental requirements
 - Cool Season
 - Warm Season

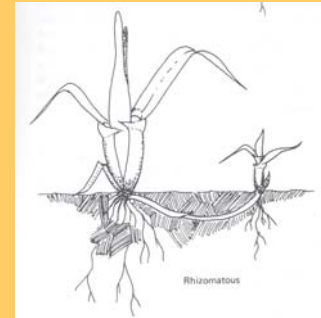
Growth habits

- Tillers – “bunch grass”
- Eg. Fescue



Growth habits

- Rhizome
- Eg. Bluegrass



Growth habits

- Stolon
- e.g. Centipede, Bermuda



Environmental requirements

- Cool
 - Thrive between 50-75 degrees
 - Requires irrigation
 - Sun or shade
 - Rye, Bluegrass, Bentgrass and Fescue

Environmental requirements

- Warm
 - Thrive between 85-95 degrees
 - Drought tolerant
 - Full sun
 - Zoysia, Bermuda or Centipede

We live in a 'transition' zone



Not all of Virginia IS Transitional



Tall Fescue –

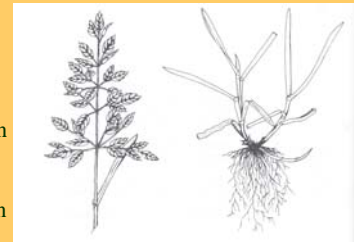


- cool season
- 75 – 85% grow it
- Bunch-type
- Deep-rooted for drought tolerance
- Coarse texture, wide blade (breeding varieties for thinner blade)

Tall Fescue

- Grows in from full sun to lightly dappled shade
- Fertility range is from kinda' poor to doing better
- 3-4 week germination

Kentucky Bluegrass



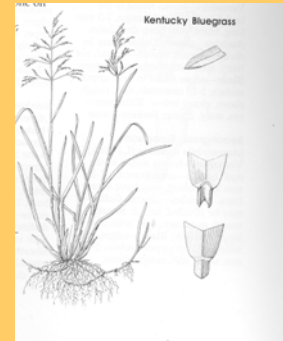
- Cool Season
- Spreading
- Strong rhizomes
- Fine texture, thin blade, dark green
- Requires full sun
- Some are shade tolerant, but they're stressed

Kentucky Bluegrass

- Shallow roots - Requires more moisture
- with 2 weeks of dryness, goes into dormancy
- With 4 weeks of dryness, some dying
- Some insect and disease problems
- Takes up to 3 weeks to germinate

Kentucky Bluegrass

- Identification
Look at tip for
canoe point =
Bluegrass



K-31

- Not Kentucky Bluegrass, but a tall fescue developed in 1931
- Coarse texture
- “Contractors’ Blend”

Perennial Ryegrass



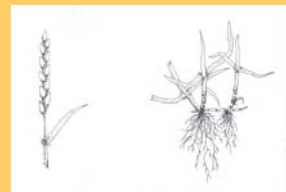
- Bunch
- Texture and color like Kentucky Bluegrass
- Special use-type grass
- Doesn't tolerate hot, dry periods
- Is durable
- Germinates quickly (found as part of blend to make us feel better)

Creeping Red Fescue



- Dry soil
- Shade tolerant
- Low fertility
- Fine texture, doesn't stand up to traffic
- Flops, never get a nice clean-mowed appearance

Zoysia



- Warm season
- Aggressive stolon
- Propagated by plugs

Buying Seed

STAFFORD HIGH ABUSE MIX			
LOT #	M12419	DATE TESTED	DOMESTIC ORIGIN
CONTAINS			
REBEL 3D	79.12 %	90.00 %	ORIGIN
PALMER II	9.70 %	90.00 %	ORIGIN
GEORGETOWN	9.92 %	80.00 %	WASHINGTON
OTHER CROP SEEDS:	0.09 %		
INERT MATTER:	1.17 %		
WEED SEEDS:	00.00 %		
UNDESIRABLE GRASS SEED PER LB.			
LOFT SEED /SEED CORPORATION OF AMERICA 4784 HOLLINS FERRY ROAD BALTIMORE MD 21227			
AMS: 598		NET WT. 50.00 LBS.	

Seller makes no warranty, either expressed or implied, as to merchantability, fitness for a particular purpose. Seller's sole warranty is that seed sold conforms to label on the container, within recognized tolerance.

- Pays to spend the extra \$ to get good seed
- Germination rate
- Variety
- Weeds
- Noxious weeds
- Date

Should I overseed or should I renovate?

- New Construction – means new turf
- 50% rule
- Don't obsess
 - Mostly green rule or "Dashboard Rule"

Should I overseed or should I renovate?

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Should I overseed or should I renovate?

- Don't obsess
 - Mostly green rule or "Dashboard Rule"
 - This isn't Augusta
 - If it is we would have greens crews
 - And THEY would know what to do
 - Handout Turf Tips: How can I plant a lawn?



What does Grass need to Grow?



- Sunlight
 - 6 hours direct = sunny
 - Shady blend is
- Moisture
- Neutral pH
- Reasonable fertility

Assess the yard



- Trees
- Soils
- Soil test
- Sunlight
- The client's desires
- The client's realistic labor input.

How to plant?

- Seed
- Sod
- Plug
- Sprig

New Lawns

- Soil test
- Kill off existing weeds
 - Insolation
 - Herbicide – watch your timing
- Amendments can be added all at once
- Till
- Smooth – roll
- Seed – roll - mulch
- Water – Water -

Renovating lawns

- Soil test
- Soil amendments as prescribed
- Herbicides if needed – watch the timing
- Rough up the soil
- Seed – mulch
- Roll
- Water

How Much Seed?

Grass Name	Warm or Cool Season	Planting date Northern Piedmont, areas to and west of the Blue Ridge	Planting date Southern Piedmont and Eastern Virginia	Seeding Rate for establishment Lbs per 1000 square feet	Seeding rate for overseeding Lbs per 1000 Square feet	Sprigging rate for establishment Bushels per 1000 square feet	Plugging rate for establishment Plugs per 1000 square feet
Kentucky Blue Grass	Cool	Aug 15 to Sept 15 or March to early April	Sept 1 to Oct 15 or Feb and March	4-6	2-3	Not recommended	Not recommended

Managing weeds

- Use the magic bullet
- There is no magic bullet
- Page 412-414



Managing weeds

- Cultural control
- Maintain density through proper mowing, fertilization
- Hand digging weeds
- Chemical control

Managing weeds

- Identify the weed
- Herbicide selection based on mode of action
- And weed life history
 - Annual weeds – use pre-emergent
 - Perennial weeds – use post-emergent

Method of application and use

- Pre-emergent (prevention)
- Post-emergent (reactive, but may only require spot treatment, and less herbicides)

Crabgrass for example

- Summer annual
- Germinates in soil temperature above 50 degrees
- Full sun
- Dies with first frost
- Control with pre-emergent
- Apply prior to germination
- Pre-April 1 (not *Forsythia* but Dogwood)

PMG for Crabgrass

Table 5.3 - Annual Grass Control with Preemergence and Postemergence Turfgrass Herbicides*

Herbicide	Crabgrass	Goosegrass	Annual bluegrass	Foxtail	Sandspur	No. of annual treatments†
Preemergent						
Benlate	3	1	1	3	1	2
Bensulide	3	3	3	3	—	1-2
DCPA	3	1	1	3	1	2
Diflufenican	3	1	1	3	—	1
Flazasulfuron	3	1	3	3	3	2
Metolachlor	3	1	3	3	3	1
Trifluralin	3	3	1	3	1	1
Postemergent						
Chlorpyrifos	3	3	3	3	1	2
Fluazifentolil	3	1	1	3	1	2
Proflumicarb	3	1	1	3	—	1
Terbufos	3	3	3	3	—	2
Trifluralin	3	3	3	3	3	2
Postemergent						
Chlorpyrifos	3	1	3	3	—	1
DCMA, MDMA	3	1	3	3	1	2-3
Fluazifentolil	3	1	3	3	—	2
Chlorpyrifos	3	1	3	3	—	1
MDMA	3	1	3	3	—	1
Chlorpyrifos	3	3	3	3	—	1

*Treated successfully, intermediate tolerance, good control at times with high rates, sometimes poor, may require more treatments per year. †Resistant to more herbicides, poor control usually less than 70%. Annual treatment requirement to give best performance rating. Lower rated rates require additional applications.

Pre-emergent

- Look in the PMG –
- Balan (benfen) -2 application per year
- crabgrass, goosegrass, annual blue, foxtail –
- betasan (Bensulide)- 1 – 2 applications
- If people unhappy, they probably didn't put down 2nd application
- Barricade (prodiamine) – 1 application depending on rain
- Tupersan (siduron) -Seed can germinate in this -Reapply in 30 days– can kill bermudagrass!
- Look at grass tolerance– Balan can kill fine fescue!!

e.g. Crabgrass – pg 5-9

Preemergence Control of Crabgrass

Annual grasses are effectively controlled with preemergence and postemergence herbicides. Crabgrass, foxtail, and annual ryegrass are effectively prevented by a number of preemergence compounds. Each herbicide ingredient may be formulated into many products (granules, 25 or more). With a wide variety of formulations, it is important to follow label instructions carefully. Preemergence herbicides are applied in early spring before seedling crabgrass emerges. Generally, it is too late for effective control if you see the seedling emerging in the lawn. Postemergence herbicides applied in spring will be sufficiently degraded or lost during the summer to allow fall seedling of fine turfgrass species.

Basic Choices of Preemergence Herbicides

Benlate (Bifent) Apply 2-3.4 lb of 25% granular (gran) per 1000 sq ft in late winter or early spring before crabgrass seedlings emerge. A second application after 2 months may be required to maintain effective crabgrass control since late summer and fall.

Bensulide (Betasan) Follow label directions for proper use. Regardless use 1-1.2 oz of a 4 fl.oz EC, 3-3.4 lb of 25% gran, or 1.5 lb of 12-12% gran per 1000 sq ft for crabgrass control. When the low label rate of 1.2 lb of active ingredient (a.i.) per acre (0.3 oz of a 4 fl.oz formulation) is used, a second application may be desirable to prevent late germinating crabgrass establishment. This application may be made about 4 months after the initial treatment.

Diflufenican (Diflufen) Use 1-1.2 oz of a 4 fl.oz EC per 1000 sq ft for preemergence crabgrass control. The most optimum timing is at crabgrass germination period. It may be used in wet and cool season turfgrasses. Discontinue its use by professional turfgrass applications only. Early preemergence control of crabgrass (before crabgrass begins to infest) is also provided by diflufenican (see under postemergence).

DCPA (Dacthal) Use 1.0 lb of 75% wettable powder (WP) or 4.1-2.0 lb of 5% gran per 1000 sq ft. A second application after 2 months or one half the regular rate is required to control late germinating crabgrass. Newly seeded turfgrass may be treated with DCPA after turfgrass has grown sufficiently to suppress 2 crabgrass.

Flazasulfuron (Flazasul) Use 1.0-4.0 lb of 25% gran or 2.2 oz of WP per 1000 sq ft in early spring prior to crabgrass emergence. Lower containing and lower are not sufficiently tolerant for Renstar treatment. Excellent results have been obtained on fine grasses and bermudagrass lawns. Tall fescue and perennial ryegrass are sufficiently tolerant to metolachlor at the low label rate (2-3.4 lb of 25% gran per 1000 sq ft). Renstar is not used on lawn lawns.

Proflumicarb (Turf Weeds Control, ProM) Apply in spring before emergence of crabgrass using 2.7 lb of Turf Weeds Control 1.7% gran per 1000 sq ft. This rate is equivalent to 2.8 per acre of proflumicarb. Use specific settings provided on product as a guide for calibration. Professional applications may use a 95 WDG formulation (ProM, Weeds Control 60WP) at 1.2 lb per 1000 sq ft.

Terbufos (Terbufos) The rate of Terbufos 65WG varies with the type of turfgrass and the annual grass being controlled. For crabgrass control, use 0.3-0.8 oz of 65% WG in bermudagrass, tall fescue, bluegrass, and brown, perennial ryegrass, and some creeping bentgrass (not putting greens).

Watch out for interactions!

Table 5.4 - Tolerance of Established Turfgrasses to Weedy Annual Grass Herbicides*

Herbicide	Kentucky bluegrass	Bermudagrass	Tall fescue	Perennial ryegrass	Fine fescue	Zoysiagrass
Preemergent						
Benlate	T	T	T	T	G	T
Bensulide	T	T	T	T	T	T
Bensulide + oxadiazon	T	T	T	T	—	T
DCPA	T	T	T	T	T	T
Diflufenican	T	T	T	T	—	T
Cryzalin	I	T	T	I	—	T
Oxadiazon	T	T	T	T	G-I	T
Proflumicarb	T	T	T	I	T	T
Prodiamine	T	T	T	I-T	I	T
Siduron	T	I	T	I	T	T
Benlate + cryzalin	S-I	T	T	I	G	T
Benlate + trifluralin	T	T	T	I-T	I	T
Postemergent						
Diflufenican	T	T	T	T	—	T
DCMA, MDMA	I-T	T	I-T	T	I	I-T
Fluazifentolil	T	S-T	T	I-T	T	T

*Relative tolerance is represented by: T=tolerant; I=use with caution at lower rates, intermediate or marginally tolerant, may cause injury and thinning; S=not sufficiently tolerant and/or not registered for use.

CAUTIONS for Chemical Control

- Pesticide Safety
- Get the right one – use the PMG
- Look for interactions with desirable species
- Make certain it is labeled for use on the species present!
- Ornamentals and drift
- not used on new lawns – wait until after 3 mowings when lawn is “established”

Best Management Practices

- Selection
- Mowing pg 407
- Thatch pg 414
- Fertilization pg 409-411
- Irrigation
- Overseeding pg 399

How much to mow?

- No more than 1/3 of blade at any one time
- short clippings are more aesthetic and recycle quicker
- SHARP BLADE!!!

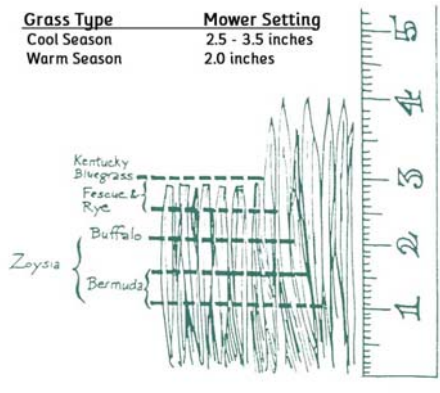


1955 research

QUIZ!



Grass Type	Mower Setting
Cool Season	2.5 - 3.5 inches
Warm Season	2.0 inches



Thatch

- Accumulation of woodier parts of plants (crowns, stolons, etc.)
- A bit of thatch is good, acts like mulch
- Bluegrass and Zoysia = thatch problems
- Fescues don't have as much problem



Problem Thatch

- Above 1 inch is a problem
- Prevents water infiltration
- Roots come to surface (dehydration)
- Harbors pests
- Makes pesticides less efficacious



QUIZ!

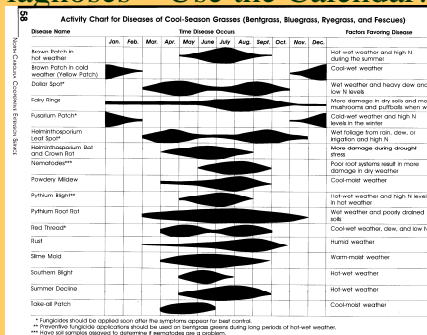
Disease triangle

- Look in the book
- Page 416
- Page 417
- Page 418
- Susceptible host
- Pathogen
- Favorable environment

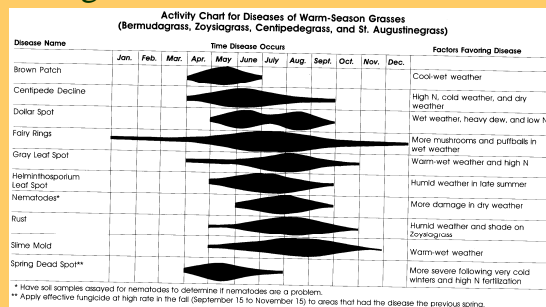
Disease Treatment

- Know the disease
- preventative applications may not be the smartest
- don't know if the disease will start
- may not be the best thing to expose yourself to
- doing nothing can be a viable alternative

Diagnoses – Use the Calendar!



Diagnoses – Use the Calendar!



Rhizoctonia for example



- Saprophytic v. parasitic
- Host and pathogen are always there
- $>65^{\circ}$ at night (June) in Cool-season grasses
- Or $< 65^{\circ}$ during the day for Warm-season grasses
- Warm(or cool), wet conditions (weather and watering practices)

Disease Treatment

- Use the PMG – Get help
- preventative applications may not be the smartest
- don't know if the disease will start
- may not be the best thing to expose yourself to

ISS TURF: Diseases

Disease	Turfgrass	Chemical [1]	Rate/1000 sq ft [2]	Season & Interval of Application
POWDERY MILDEW (<i>Erysiphe graminis</i>)	Bermudagrass	Bayleton 50 DF	0.5-1.0 oz	June-September
	Bluegrass			15-30 days
	Fescues	Banner Maxx	1.0-2.0 oz	14-28 days
		Eagle WSP	0.6 oz	14 days
PYTHIUM BLIGHT (<i>P. aphanidermatum</i> and <i>P. ultimum</i>)	Bentgrass	Chipco Signature	4.0 oz	14 days
	Bluegrass	Atude	5.5 oz	14 days
	Bermudagrass	Barcol 6F	1.33-4.0 oz	7-21 days
	Fescues	Heritage 50 WG	0.4 oz	10-14 days
	Zoysia	Insigna 20 WG	0.5-0.9 oz	14 days
		Subdue Maxx	0.5-1.0 oz	10-21 days
RHIZOCTONIA BLIGHT (“Brown patch”) (<i>Rhizoctonia solani</i>)	Bentgrasses, Bluegrasses	26 GT	3.0-4.0 oz	July-August
	Ryegrasses			7-14 days
	Bermudagrass	Compass WDG 50%	0.15-0.25 oz	14-21 days
	Fescues	Curialin EG	1.0 oz	14-21 days
	Zoysia	Daconil Weather Sdk	2.0-3.5 oz	7-14 days
		Daconil UltraX	1.8-5.0 oz	7-14 days
		Eagle WSP	0.6 oz	14 days
		Foro 80 WP Rainshield	4.0 oz	7-10 days
		Heritage 50 WG	0.2-0.4 oz	14-28 days
		Insigna 20 WG	0.5-0.9 oz	14-28 days
		Prostar 70 WP	1.5-3.0 oz	14-21 days
	Spectro 90 WG	4.0 oz	14 days	

Disease Treatment

- doing nothing can be a viable alternative
- Red thread – cool wet weather and poor fertility
- Powdery Mildew – low light, over fertilization
- Slime Mold – warm wet weather or winter

Irrigation

- 1 inch per week (slowly, at one time)
- but dependent on grass species, previous rain and temperature
- Water early
 - Less evaporation
- Don't water late
 - disease

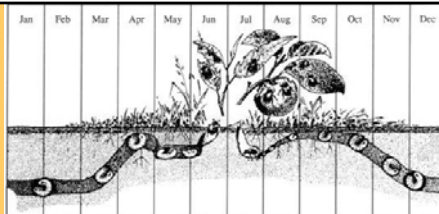
Insects



White grub

- White grubs,
 - Japanese beetles,
 - Green June bug,
 - European chafer
- Know their life cycle for best control

Life cycle



- June adults feeding on plants, into July
- Late July mating time
- Females burrow into thatch layer, lay eggs
- Adults die
- Larvae start feeding on roots in July and August
- As temperatures decrease (September, October), they migrate into soil 8 – 10 inches
- April, May start their way back up, feeding on roots as they go

Control - Chemical

- Best time is late summer, targeting young grubs which are close to surface and most vulnerable to insecticide
- Pre-water to draw grubs into cool, moist soil, apply insecticide
- All insecticides used are broad-spectrum, do kill worms and beneficial insects that are near or at the surface (but there are others deeper in soil)
- Beware of the endless cycle

Control - Other

- Milky spore – specific to the Japanese beetle
- Bacteria – takes 2 – 3 years for 100% cover
- Predatory nematodes
- Patience

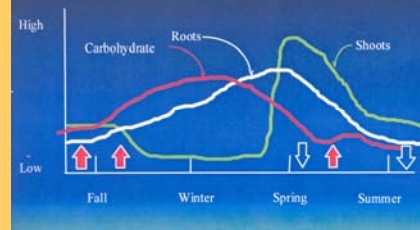
Fertilization

- Essential to good stewardship
- Apply it when the plant can use it

Look at the effects of Fertilization

- Prince William MG Teaching Garden Photo
- Good turf prevents erosion
- Good turf aids water infiltration
- Lowers ambient temperature in summer
- Raises it in winter
- Good turf needs less pesticide

Seasonal Growth Patterns Cool Season Grasses



Fertilization Program

- Cool season program
- SON
- Get a soil test
- Calibrate spreader

Enjoy March Madness

QUIZ

- Don't buy that weed 'n feed they advertise
- Unless you REALLY love to Mow don't fertilize in the Spring!
- Loobey doesn't have a good lawn and his kids can't play on it